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SOURCE La Machine Moderne.RECENT SOVIET LATHES AND GRINDING MACHINES

The following article on Soviet progress in constructing automatic lathes and grinding machines is from the Paris periodical La Machine Moderne of May 1953.

A definite development in the construction of automatic lathes in Russia appears to have taken place during the last few years. No figures have been obtained on the rate of production of these machines, or on the capacity of the producing plants. However, some of the main features of the machines are worth noting.

1. A semiautomatic lathe especially designed for machining the inner and outer races of ball and roller bearings 140-245 millimeters in diameter. -- The longitudinal and transverse rams have 77 feeds, from 0.045 to 1,575 millimeters. The maximum longitudinal stroke is 220 millimeters; maximum transverse stroke, 24 millimeters. There are 12 spindle speeds ranging from 52 to 400 rpm. All moving parts are pressure lubricated; and the pump and rapid cross travel have individual motors.

2. An automatic six-spindle lathe with a bar capacity of 85 millimeters and a maximum bar feed of 185 millimeters. -- It has four cross slides and one auxiliary slide. The feeds, which are hydraulic, are selected by dial. Feed of the main tools is from 0 to 185 millimeters; of the cross slides, 100 millimeters. The spindle has an infinitely variable speed of from 127 to 1,200 rpm. There is push-button control on both sides of the machine. The driving motor has 25 horsepower.

3. A single-spindle automatic lathe with a horizontal six-station turret and a cross slide. -- Bar capacity is 20 millimeters. Maximum bar feed is 100 millimeters; travel of the turret slide is 210 millimeters; and travel of the cross slide, 115 millimeters. The spindle speeds, up to 6,000 rpm, and the feeds of the turret for each position are selected by electromagnetic clutches.

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The three feeds of the turret and of the cross slide are from 0.05 to 0.2, and from 0.02 to 0.1 millimeter, respectively. A larger model of this machine has a bar capacity of 25 millimeters; maximum length that can be turned is 150 millimeters.

4. A single-spindle automatic cutting-off lathe with a chuck capacity of 10 millimeters, and a vertical hexagonal turret. -- Maximum bar feed is 88 millimeters [text has 8 8/]. Speeds are infinitely variable from 100 to 2,000 rpm. Drive is by a 6 3/4 horsepower direct current motor, with spindle speed and direction of rotation selected for each position of the turret. A vertical slide and two cross slides have maximum strokes of 38 millimeters; the hexagonal turret has a stroke of 76 millimeters.

5. An automatic four-spindle lathe, with a 38-millimeter bar capacity, designed for high performance with carbide tools. -- There are 24 spindle speeds ranging from 158 to 2,170 rpm. Maximum machinable length is 196 millimeters, with feeds of from 9.5 to 76 millimeters. The four cross slides, controlled by cams, have feeds of from 0 to 105 millimeters. The longitudinal slides are independent of one another and are provided with manual travel. This machine is also built with six spindles and six cross slides. It has electrical locking devices and automatic lubrication. The motor has 27 horsepower.

6. A universal copying lathe. -- Height of centers is 200 millimeters and distance between centers, 990 millimeters. This lathe can cut metric threads from 16 to 240 millimeters at a speed of from 2 to 30 rpm; and single or multiple, straight or tapered British threads. The spindle speeds, push-button controlled, are variable from 18 to 3,000 rpm. Longitudinal feeds are from 0.05 to one millimeter; and cross feeds, from 0.025 to 0.05 millimeter. Rapid travel is 45 and 20 meters per minute. Copying is done by an electric follower.

7. A lead-screw cutting lathe with a capacity of 2,500 millimeters between centers. -- Drive is by a 4-horsepower motor at two speeds, which by change gears provides nine cutting speeds of from 7.5 to 65 rpm with normal rotation, and from 15 to 150 rpm with inverse rotation. Threads from 3 to 12 millimeters can be cut on workpieces from 20 to 75 millimeters in diameter. Lead-screw errors are automatically corrected by a compensating cam. The machine has a one-quarter horsepower coolant pump.

Examples of recent grinding machines are the following:

1. A cylindrical precision grinding machine with a capacity of 482 millimeters between centers and a 64-millimeter height of centers. -- The work head is driven by a direct current motor, electronically controlled, at infinitely variable speeds of from 100 to 1,000 rpm. The longitudinal travel of 585 millimeters, with hydraulic controls, operates in an automatic cycle at a speed of from 0.2 to 6.3 millimeters per minute, or manually by a crank at the rate of 13.5 millimeters. Speeds of the grinding wheel, which is 400 millimeters in diameter, are 1,800 and 2,200 rpm. The feeds are from 0.0025 to 0.025 millimeters per workpiece stroke.

2. A grinding machine with optical projection, which appears to have highly perfected controls. -- An enlargement of 50 X can be obtained.

3. A machine for grinding carbide tools by electrolysis. -- A cast-iron or steel wheel serves as the cathode, and the tool represents the anode, immersed in an appropriate dielectric fluid. A direct current passes through this circuit, and a thin film of carbide is removed by electrochemical action. This method eliminates the use of special grinding wheels, as well as the final polishing operation. Any risk of local deformation of the tool nose or burning of the surface is completely obviated. The wheel, 84 millimeters in diameter, revolves at 1,280, 1,600, or 2,000 rpm. The maximum size of tools which can

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be sharpened is 30 by 45 by 310 millimeters. Cross travel of the wheel is 85 millimeters. Longitudinal travel of the table, which is 450 by 160 millimeters, is 250 millimeters. The entire mechanical part is carefully protected, and all the controls, which are the push-button type, are grouped in one panel.

Many other Soviet machines incorporate the most modern techniques known at present, notably in electronics. For instance, there is a toolroom lathe whose spindle speed is automatically adjusted to assure a constant cutting speed. However, only a few typical machines, on which it was possible to obtain specifications, are treated above.

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